element of the claim must be described, either expressly or inherently, in a single prior art reference (M.P.E.P. §2131, quoting from *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 621 (Fed. Cir. 1987)). As acknowledged previously by the USPTO, LAUBE does not expressly describe Applicants' tire bead area compound. The USPTO therefore relies on KITAHARA as evidence that tire inner liner compositions may be used interchangeably with tire bead filler compositions.

Applicants disagree with the USPTO's interpretation of col. 5, lines 3-6 of KITAHARA. The paragraph of KITAHARA cited from by the USTPO begins as follows:

> " Since a compound of the modified rubber obtained by the method of this invention has excellent green strength in the unvulcanized state and excellent dynamic properties such as tear strength, fatigue resistance and rebound after vulcanization , it is useful as the carcasses, treads, side walls, bead fillers and inner liners of vehicle tires, ... "

Some tire compounding ingredients may be present in rubber compounds to be used for different tire components, at the same or in varying amounts. However, each rubber composition used for a specific tire component will be highly engineered for that component. Evidence that a functional polymer may broadly have application in different rubber compositions does not support the contention that the inner liner compositions of LAUBE inherently disclose Applicants' bead filler compositions.

As evidence of Applicants' assertions, Applicants point to the inner liner compositions and properties disclosed in LAUBE, and the formulations and properties disclosed in Applicants specification. These compositions vary in ingredients and amounts, resulting in different physical properties for the inner liner versus the bead filler compositions. Most notably, Applicants wish to point out the differences in Mooney Viscosity, Modulus/Elongations (Applicants' compounds report breakage at slightly greater than 300% elongation) and rebound.

As additional evidence of the differences in composition and physical properties between the two compounds, Applicants' submit exemplary inner liner and bead filler formulations, and physical properties thereof (*The Rubber Formulary*, Ciullo, Peter, 1999 pp. 78, 195-197). These compounds differ both in formulation and ingredients, as well as physical properties. Specifically interesting are the differences

in hardness and elongation at break. Applicants believe that this additional reference serves as evidence that tire inner liner and bead filler compounds are not interchangeable, and that the use of a tire inner liner composition as a bead filler composition cannot be inherent in a reference that only discloses the use of such composition as an inner liner.

Conclusion

Applicants respectfully request reconsideration of the pending claims. Applicants attorney further requests a telephone interview to discuss the pending office action at the Examiner's convenience.

Respectfully Submitted By:

7 June 2004
Date

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THE RUBBER FORMULARY

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TIRE BEAD FILLER/APEX COMPOUND

Uniroyal

Naugard® Q	----	2.0	----
Novazone® AS	----	----	2.0
Natural Rubber	100.0	100.0	100.0
Phenol Formaldehyde Resin	10.0	10.0	10.0
N-351 Black	55.0	55.0	55.0
Aromatic Oil	5.0	5.0	5.0
Zinc Oxide	10.0	10.0	10.0
Stearic Acid	2.0	2.0	2.0
SP 6700 Resin	2.0	2.0	2.0
Bonding Agent M3P	2.0	2.0	2.0
Delac® NS	0.6	0.6	0.6
Benzyl Tuex® (TBzTD)	0.25	0.25	0.25
CPT (vulcanization inhibitor)	0.25	0.25	0.25
Insoluble Sulfur, 80% Oiled	5.0	5.0	5.0
Mooney Viscosity			
ML (1+4) @ 100°C	49	51	52
Mooney Scorch, MS @ 132°C			
3 pt Rise, minutes	15.9	16.3	15.1
Physical Properties at Room Temperature			
Press Cured 10 minutes @ 177°C			
Tensile Strength, MPa	15.7	16.2	17.7
Elongation, %	370	350	450
200% Modulus, MPa	8.1	8.3	9.7
300% Modulus, MPa	13.1	13.7	13.4
Hardness, Shore A	84	85	87
Tear, Die C, kN/m	39	40	37
Oven Aging, 2 Days @ 100°C, % Retention			
Tensile Strength	49	59	74
Elongation	26	31	27
Hardness, points change	+6	+5	+1
Tear, Die C	52	61	62
Oven Aging, 2 Weeks @ 70°C, % Retention			
Tensile Strength	61	73	77
Elongation	31	40	33
Hardness, points change	+5	+5	+1
Tear, Die C	59	65	71
DeMattia Flexing - Unaged			
Kilocycles (kc) to failure	8	12	84

INNERLINERS

R.T. Vanderbilt

	1	2	3
Chlorobutyl 1065	100.0	80.0	---
Chlorobutyl 1066	---	---	60.0
Natural Rubber	---	20.0	25.0
Plioflex 1778	---	---	20.6
N-660 GPF Black	60.0	55.0	---
N-330 HAF Black	---	---	40.0
Whiting (OMYA)	---	---	40.0
Phenol-Formaldehyde Resin	4.0	8.0	4.0
Struktol 40 MS	7.0	10.0	---
Naphthenic Oil	8.0	---	10.0
Stearic Acid	2.0	2.0	1.0
Magnesium Oxide	0.15	---	0.5
Zinc Oxide	3.0	3.0	3.0
Sulfur	0.5	0.5	---
ALTAX	1.5	1.5	1.0
Vultac 5	---	---	1.3
METHYL TUADS	---	---	0.25
Mooney Viscosity at 100°C, ML			
1+4 Minute Reading	43	52	54
Mooney Scorch, MS			
Minutes to 3 Pt. Rise, 135°C	12	12	---
Minutes to 5 Pt. Rise, 121°C	---	---	15
Original/After Aging 3 Days at 125°C in Air			
Cure Time, Minutes at 160°C	25	25	20
Shore A Hardness	55/74	63/76	55
300% Modulus, MPa	3.2/8.3	3.6/6.8	5.2
Tensile Strength, MPa	8.1/8.6	10.8/8.7	11.1
Elongation, %	860/330	850/510	520
Tear Strength, kN/m at 100°C	27	25	28
Air Permeability, 66°C			
Q x 10^3	3.0	6.0	8.2
General Purpose Rubber Carcass Adhesion, 100°C			
kN/m	4.4 1*	15.0 S/1*	---
*S denotes stock tearing; 1 denotes interfacial separation			
Monsanto Fatigue-to-Failure			
Extension, %	140	140	100
Kilocycle to Failure	415	434	236

INNERLINER

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Exxon Bromobutyl 2255	100.0
Carbon Black GPF (N-660)	50.0
Flexon 876	8.0
Stearic Acid	2.0
Maglite D	0.5
Mineral Rubber	7.0
Sulfur	0.5
ALTAX	1.5
Mooney Viscosity at 100°C	
1+8 Min. Reading	65
Mooney Scorch at 135°C	
Min. to 5 Pt. Rise	22
Rheometer at 150°C	
ML/MH, lb/in	18/44
tc90, Min.	37
Monsanto Tel-Tak, kPa (30 s, 16 oz.)	
• To Self	240
• To 100% NR Carcass	125
• To 50/50 NR/SBR Carcass	80
• To 25/75 NR/BR Chafer	85
Green Strength, MPa x 10^{-2}	27
Decay Time to 50% of Initial Stress, s	32
Press Cured Tc90 Minute at 150°C	
Initial/After Aging 3 Days at 125°C in Air	
Hardness, Shore A	44/48
100% Modulus, MPa	1.1/1.5
300% Modulus, MPa	3.7/4.8
Tensile Strength, MPa	11.8/10.4
Elongation at Break, %	756/687
Tear Strength, kN/m	40/36
Monsanto Fatigue-to-Failure	
K cycles, 140% Extension	
Mean	40
Range	25-55

INNERLINER
Continued

Static Peel Adhesion to 100% NR Carcass, kN/m * = Separation with stock tearing	35*
Permeability to Air at 65°C $cm^3.cm.cm^{-2}.s^{-1}.atm^{-1}.10^{-8}$	3.0
Water Vapor Permeability at 65°C $g.cm.cm^{-2}.h^{-1}.atm^{-1}.10^{-6}$	2.5